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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|---------------------------------------------------------------------------------|-------------|----------------------|---------------------|------------------|
| 10/646,847 | 08/25/2003 | Kazunori Masuda | 00862.022501.1 | 1797 |
| 5514 | 7590 | 04/06/2004 | EXAMINER | |
| FITZPATRICK CELLA HARPER & SCINTO 30 ROCKEFELLER PLAZA NEW YORK, NY 10112 | | | NGUYEN, LAM S | |
| | | | ART UNIT | PAPER NUMBER |
| | | | 2853 | |

DATE MAILED: 04/06/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

| | | | |
|------------------------------|--------------------------------------|--------------------------------------|--|
| Office Action Summary | Application No. 10/646,847 | Applicant(s) MASUDA ET AL. | |
| | Examiner LAM S NGUYEN | Art Unit 2853 | |

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-9 and 15-18 is/are pending in the application.
 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-5,8,9 and 15-18 is/are rejected.
- 7) ☒ Claim(s) 6 and 7 is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 25 August 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
 Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
 Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
 a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☒ Certified copies of the priority documents have been received in Application No. 10/059,440.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|-------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) Paper No(s)/Mail Date. ____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date <u>04/01/2004</u> . | 6) <input type="checkbox"/> Other: ____ |

DETAILED ACTION

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

1. Claims 1-5, 8-10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Stephenson et al. (US 5053790) in view of Schantz (EP 0642925 A2).

Stephenson et al. disclose a printing apparatus having a printhead (FIG. 5, element 26) and a voltage control unit controlling the printhead (FIG. 5, element 310) comprising:

reception means for receiving an information signal transmitted from the printhead (FIG. 5, element 511); and

voltage generation means (FIG. 5, element 513) for generating a driving voltage which is adjusted to drive the printhead based on the information signal received by said reception means.

Stephenson et al. do not disclose wherein the printing apparatus performs printing by scanning a carriage unit, capable of holding an ink jet printhead over a print medium based on information transmitted by an external apparatus and wherein said control voltage control unit is provided on the carriage unit (**Referring to claim 18**).

Schantz discloses a printer that performs printing by scanning a carriage unit (FIG. 3, element 48), capable of holding an ink jet printhead (FIG. 3, element 50 and FIG. 1a-b) over a print medium, wherein the carriage unit comprises a voltage control unit for controlling the

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printhead (in term of “power-conditioning circuitry” (Abstract)) for regulating the power provided to nozzle resistors (column 3, line 39-47).

Therefore, it would have been obvious for one having ordinary skill in the art at the time the invention was made to modify the carriage unit in the printing apparatus disclosed by Stephenson et al. such that providing the voltage control unit for controlling the printhead on the carriage unit as disclosed by Schantz. The motivation of doing so is to avoid a high peak current transmission between a stationary device and a scanning print device in order to avoid the electrical fault caused by the flow of the high current in the connection as taught by Schantz (column 3, line 57 to column 4, line 2).

Stephenson et al. also disclose the following claimed invention:

Referring to claim 2: wherein said voltage generation means is a DC/DC converter which transforms a DC voltage to be applied to the printhead into a value appropriate for driving a mounted head (FIG. 5: Element 513 converts a DC voltage input to a DC voltage output).

Referring to claim 3: wherein the information signal includes an identification signal for identifying a type of the printhead, and said voltage generation means controls the driving voltage in accordance with the identification signal (column 1, line 40-45: a memory stores head resistance values that are different for different heads).

Referring to claim 4: wherein the information signal includes a signal indicative of a variation of a plurality of heater resistances provided in the printhead, and said voltage generation means controls the voltage in accordance with the signal (column 1, line 40-47).

Referring to claim 5: wherein the information signal includes a signal indicative of temperature data of the printhead, and said voltage generation means controls the driving voltage

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in accordance with said signal (FIG. 5: element 506 is a thermal sensor sensing the temperature of the printhead).

Referring to claims 9, 15-17: wherein said heat source number detection means (FIG. 7, element 310) detects the number of plurality of heat sources driven simultaneously based on an image data signal (FIG. 7, element 730 and Abstract).

2. Claim 8 is rejected under 35 U.S.C. 103(a) as being unpatentable over Stephenson et al. (US 5053790) in view of Schantz (EP 0642925 A2) as applied to claim 1, and further in view of Dunn (US 4982199).

Stephenson et al., as modified, disclose the claimed invention as discussed above except driving pulse generation means for generating a pulse train which drives the plurality of heat sources.

Dunn discloses a thermal ink jet printer having driving pulse generation means for generating a pulse train which drives the plurality of heat sources (FIG. 2 and FIG. 3A-G) to control the volume of droplets by varying the pulse train thereby effecting gray scale printing (column 2, line 10-14).

Therefore, it would have been obvious for one having ordinary skill in the art at the time the invention was made to modify the printing apparatus disclosed by Stephenson et al., as modified, such that including driving pulse generation means for generating a pulse train which drives the plurality of heat sources as disclosed by Dunn. The motivation of doing so is to control the volume of droplets by varying the pulse train thereby effecting gray scale printing as taught by Dunn (column 2, line 10-14).

Allowable Subject Matter

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2. Claims 6-7 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Referring to claim 6: The most pertinent art fails to disclose wherein said voltage generation means compares a reference voltage, divided by the internal resistance, detection resistance provided inside the printhead, with a driving voltage which drives the printhead, then controls the driving voltage so as to cancel an error in these voltages. Therefore, the claimed invention is not disclosed by the cited prior arts.

Referring to claim 7: The most pertinent art fails to disclose wherein said voltage generation means compares a reference voltage, divided by the internal resistance, detection resistance provided inside the printhead, and the diode, with a driving voltage which drives the printhead, then corrects an error in these voltages. Therefore, the claimed invention is not disclosed by the cited prior arts.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to LAM S NGUYEN whose telephone number is (571)272-2151. The examiner can normally be reached on 7:00AM - 3:30PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, STEPHEN D MEIER can be reached on (571)272-2149. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

LN

April 1, 2004



HAI PHAM
PRIMARY EXAMINER